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Polymer films as acoustic matching layers

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Abstract:

Polymer films such as polyimide and Parylene were investigated as acoustic matching layers at frequencies in the 100-200-MHz range. Polyimide films were spin coated and Parylene films were vapor deposited on silicon and glass substrates, respectively. The curing temperature of the polyimide films was also varied to determine the dependence of the material properties on processing conditions. The impedance of the films were measured to be in the 2.7 to 3.7 Mrayl range. The measurements indicate that these films promise good transmission efficiencies between most liquids and especially low impedance solids such as silicon, glass, and quartz.

Index Terms:

[acoustic impedance](#) [acoustic materials](#) [polymer films](#) [ultrasonic absorption](#) [ultrasonics](#) [100 to 200 MHz](#) [Parylene](#) [Si substrate](#) [acoustic attenuation](#) [acoustic matching layer](#) [temperature](#) [glass substrates](#) [liquids](#) [polyimide](#) [processing conditions](#) [sound velocity](#) [coated films](#) [transmission efficiencies](#) [vapour deposited films](#)

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